

U.S. DEPARTMENT OF COMMERCE PATENT AND TRADEMARK OFFICE		ATTORNEY'S DOCKET NUMBER SABATINI=2
TRANSMITTAL LETTER TO THE UNITED STATES DESIGNATED/ELECTED OFFICE (DO/EO/US) CONCERNING A FILING UNDER 35 U.S.C. 371		U.S. APPLICATION NO. (If known, see 37 CFR 1.5) 09/869525
INTERNATIONAL APPLICATION NO. PCT/IT00/00428 ✓	INTERNATIONAL FILING DATE 24 October 2000 ✓	PRIORITY CLAIMED 29 October 1999 ✓
TITLE OF INVENTION WATER SOLUBLE COMPLEX FERTILISERS, METHOD FOR THEIR PREPARATION AND...		
APPLICANT(S) FOR DO/EO/US Nicola SABATINI		
<p>Applicant herewith submits to the United States Designated/Elected Office (DO/EO/US) the following items and other information:</p> <ol style="list-style-type: none"> <input checked="" type="checkbox"/> This is a FIRST submission of items concerning a filing under 35 U.S.C. 371 <input type="checkbox"/> This is a SECOND or SUBSEQUENT submission of items concerning a filing under 35 U.S.C. 371. <input checked="" type="checkbox"/> This is an express request to begin national examination procedures (35 U.S.C. 371(f)) at any time rather than delay examination until the expiration of the applicable time limit set in 35 U.S.C. 371(b) and PCT Articles 22 and 39(1). <input type="checkbox"/> The US has been elected in a Demand by the expiration of 19 months from the priority date (PCT Article 31). <input checked="" type="checkbox"/> A copy of the International Application as filed (35 U.S.C. 371(c)(2)) <ol style="list-style-type: none"> <input type="checkbox"/> is attached hereto (required only if not transmitted by the International Bureau). <input checked="" type="checkbox"/> has been communicated by the International Bureau. <input type="checkbox"/> is not required, as the application was filed in the United States Receiving Office (RO/US). <input type="checkbox"/> An English language translation of the International Application as filed (35 U.S.C. 371(c)(2)). <input checked="" type="checkbox"/> Amendments to the claims of the International Application under PCT Article 19 (35 U.S.C. 371(c)(3)) <ol style="list-style-type: none"> <input type="checkbox"/> are transmitted herewith (required only if not transmitted by the International Bureau). <input type="checkbox"/> have been communicated by the International Bureau. <input type="checkbox"/> have not been made; however, the time limit for making such amendments has NOT expired. <input checked="" type="checkbox"/> have not been made and will not be made. <input type="checkbox"/> An English language translation of the amendments to the claims under PCT Article 19 (35 U.S.C. 371(c)(3)). <input checked="" type="checkbox"/> An oath or declaration of the inventor(s) (35 U.S.C. 371(c)(4)). <input type="checkbox"/> An English language translation of the annexes to the International Preliminary Examination Report under PCT Article 36 (35 U.S.C. 371(c)(5)). <p>Items 11. to 16. below concern document(s) or information included:</p> <ol style="list-style-type: none"> <input type="checkbox"/> An Information Disclosure Statement under 37 CFR 1.97 and 1.98. <input type="checkbox"/> An Assignment document for recording. A separate cover sheet in compliance with 37 CFR 3.28 and 3.31 is included <input checked="" type="checkbox"/> A FIRST preliminary amendment <input type="checkbox"/> A SECOND or SUBSEQUENT preliminary amendment. <input type="checkbox"/> A substitute specification. <input type="checkbox"/> A change of power of attorney and/or address letter. <input checked="" type="checkbox"/> Other items or information. <ul style="list-style-type: none"> <input checked="" type="checkbox"/> Courtesy copy of the International Application as filed. <input checked="" type="checkbox"/> Courtesy copy of the first page of the International Publication (WO 01/30724) <input checked="" type="checkbox"/> Formal drawings, 1 sheet, Figures 1-1. <input checked="" type="checkbox"/> Courtesy Copy of the International Search Report. <input checked="" type="checkbox"/> Application Data Sheet <input checked="" type="checkbox"/> The application is (or will be) assigned to: S.I.S.O. Societa Industria Sequestranti Organici Srl, whose address is Piazza Lega Lombarda, 1 - 20154 MILANO - ITALY. 		

U.S. APPLICATION NO. (If known, see 37 CFR 1.5) <div style="font-size: 24pt; font-weight: bold; margin-top: 10px;">09/869525</div>	International Application No PCT/IT00/00428	Attorney's Docket No SABATINI=2
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17. [xx] The following fees are submitted:

BASIC NATIONAL FEE (37 CFR 1.492 (a)(1) –(5):
 Neither international preliminary examination fee (37 CFR 1.482)
 nor international search fee (37 CFR 1.445(a)(2)) paid to USPTO
 and International Search Report not prepared by the EPO or JPO... .. **\$1000.00**

International preliminary examination fee (37 CFR 1.482) not paid to
 USPTO but International Search Report prepared by the EPO or JPO **\$860.00**

International preliminary examination fee (37 CFR 1.482) not paid to USPTO but
 international search fee (37 CFR 1.445(a)(2)) paid to USPTO... .. **\$710.00**

International preliminary examination fee paid to USPTO (37 CFR 1.482)
 but all claims did not satisfy provisions of PCT Article 33(1)-(4) **\$690.00**

International preliminary examination fee paid to USPTO (37 CFR 1.482)
 and all claims satisfied provisions of PCT Article 33(1)-(4)..... **\$100.00**

ENTER APPROPRIATE BASIC FEE AMOUNT =

Surcharge of **\$130.00** for furnishing the oath or declaration later than [] 20 [] 30
 months from the earliest claimed priority date (37 CFR 1.492(e)).

Claims as Originally Presented	Number Filed	Number Extra	Rate		
Total Claims	31 - 20	11	X \$18.00	\$	198.00
Independent Claims	2 - 3		X \$80.00	\$	
Multiple Dependent Claims (if applicable)			+\$270.00	\$	
TOTAL OF ABOVE CALCULATIONS =					\$1,058.00

Claims After Post Filing Prel. Amend	Number Filed	Number Extra	Rate		
Total Claims	- 20		X \$18.00	\$	
Independent Claims	- 3		X \$78.00	\$	
TOTAL OF ABOVE CALCULATIONS =					\$1,058.00

Reduction of ½ for filing by small entity, if applicable. Applicant claims small entity
 status. See 37 CFR 1.27. \$ 529.00

SUBTOTAL = \$ 529.00

Processing fee of **\$130.00** for furnishing the English translation later than [] 20 [] 30
 months from the earliest claimed priority date (37 CFR 1.492(f)). \$

TOTAL NATIONAL FEE = \$ 529.00

Fee for recording the enclosed assignment (37 CFR 1.21(h)). The assignment must be
 accompanied by an appropriate cover sheet (37 CFR 3.28, 3.31). **\$40.00** per property + \$

TOTAL FEES ENCLOSED = \$ 529.00

	Amount to be:	
	refunded	\$
	charged	\$

CALCULATIONS PTO USE ONLY

a. [] A check in the amount of \$_____ to cover the above fees is enclosed.

b. [X] Credit Card Payment Form (PTO-2038), authorizing payment in the amount of \$ 529.00, is attached.

c. [] Please charge my Deposit Account No. **02-4035** in the amount of \$_____ to cover the above fees.
 A duplicate copy of this sheet is enclosed

d. [XX] The Commissioner is hereby authorized to charge any additional fees which may be required, or credit any overpayment
 to Deposit Account No. **02-4035**. A duplicate copy of this sheet is enclosed.

NOTE: Where an appropriate time limit under 37 CFR 1.494 or 1.495 has not been met, a petition to revive (37 CFR 1.137(a) or
 (b)) must be filed and granted to restore the application to pending status.

SEND ALL CORRESPONDENCE TO:

BROWDY AND NEIMARK, P.L.L.C.
624 NINTH STREET, N.W., SUITE 300
WASHINGTON, D.C. 20001
TEL: (202) 628-5197
FAX: (202) 737-3528
 Date of this submission: **June 29, 2001**

SIGNATURE
Roger L. Browdy

NAME
25,618

REGISTRATION NUMBER

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:)	Art Unit:
Nicola SABATINI)	
)	
IA No.: PCT/IT00/00428)	
)	Washington, D.C.
IA Filed: 24 October 2000)	
)	
U.S. App. No.:)	
(Not Yet Assigned))	
)	June 29, 2001
National Filing Date:)	
(Not Yet Received))	
)	
For: WATER SOLUBLE...)	Docket No.: SABATINI=2

PRELIMINARY AMENDMENT

Honorable Commissioner for Patents and Trademarks
Washington, D.C. 20231

Sir:

Contemporaneous with the filing of this case and
prior to calculation of the filing fee, kindly amend as
follows:

IN THE SPECIFICATION

After the title please insert the following
paragraph:

REFERENCE TO RELATED APPLICATIONS

--The present application is the national stage
under 35 U.S.C. 371 of international application
PCT/IT00/00428, filed 24 October 1999 which designated the
United States, and which international application was
published under PCT Article 21(2) in the English language.--

In re of: Nicola SABATINI (SABATINI=2)

REMARKS

The above amendment to the specification is being made to insert reference to the PCT application of which the present case is a U.S. national stage.

Favorable consideration and allowance are earnestly solicited.

Respectfully submitted,
BROWDY AND NEIMARK, P.L.L.C.
Attorneys for Applicant

By: 

Roger L. Browdy

Registration No. 25,618

RLB:wrđ

Telephone No.: (202) 628-5197

Facsimile No.: (202) 737-3528

Description

Water Soluble Complex Fertilisers. Method for their Preparation and Related Use

Technical Field

The present invention relates to a complex NPK fertiliser in the form of granules or prills, and to a method for its preparation and to the related use of the fertiliser thereby obtained. In particular, the present invention relates to a fertiliser containing as fertilising elements Nitrogen N, Phosphor P, Potassium K, meso elements like Calcium Ca, Magnesium Mg, Sulphur S, and micro elements like Iron Fe, Manganese Mn, Zinc Zn, Copper Cu, Boron B and Molybdenum Mo.

Background Art

Complex NPK fertilisers containing meso and micro elements are known in the trade. These types of fertilisers are obtained by etching phosphatic rocks with sulphuric, nitric or phosphoric acid with the subsequent ammonification and addition of Potassium in the form of potassium sulphate or potassium chloride to obtain a suspension or pulp. The solution or pulp is then transformed into solid particles shaped as granules or prills, by means of granulating processes or through the prilling of the molten salts. Although these kinds of fertilisers contain in full or in part the nutrients necessary for crops, they are not free of disadvantages. One disadvantage is that of not being perfectly water soluble due to the presence of the residues deriving from the etching of the phosphatic rocks, i.e. if solubilised they leave an insoluble residue. The direct application of the solution of complex NPK fertilisers thereby obtained causes the blockage of distribution systems in fertilisation-irrigation, leaf fertilisation, and hydroponic fertilisation systems.

There are patents that relate to the production of water soluble complex NPK fertilisers that contain meso and micro elements.

All such methods provide for obtaining a solution of molten salts containing

N, generally NH_4 , NO_3 , with the subsequent addition of solid salts containing P such as $\text{NH}_4\text{H}_2\text{PO}_4$ or $(\text{NH}_4)_2\text{HPO}_4$ and/or K such as K_2SO_4 and KCl . The limitation for these methods consists of the fact that the added phosphatic and/or potassic salts are in solid form and can give rise to a suspension, leading to problems of inconsistency in the molten solution in addition to high viscosity levels, which as is well known prevent the perfect homogenisation of the solution.

It is known that the production of highly soluble complex NPK fertilisers available on the market is carried out by mixing the various sources of N, P, K, perfectly soluble meso and micro elements, after grinding the components to obtain a uniform grain size. This common practice presents two disadvantages. The first disadvantage is that the product thereby obtained contains dusts due to the grinding, creating problems in any direct application. The second disadvantage is that of having to mix together components having different density with the consequent problems of component segregation during the preparation, transport, storage of the sacks and during the mechanical distribution on the soil.

Also commercially available are products which do not present segregation or dustiness problems, both in the form of granules, prills or crystals which are perfectly water soluble, but bring to the crops only two nutrients among N, P, and K and at times meso and micro elements. I.e., NP, KP, and NK fertilisers are available.

It is also well known that all fertilisers have the tendency to become compacted due to the irregularity of the particles, lack of homogeneity of the particles, and residual humidity.

Disclosure of Invention

One of the aims of the present invention is to provide a method which allows to obtain a water soluble complex NPK fertiliser in granules or prills, highly soluble in water, which may contain meso and micro elements and has perfectly predictable composition characteristics since each granule or prill derives from a solution with homogeneous composition.

Another aim of the proposed method is to provide a water soluble complex NPK fertiliser in granules or prills, which does not present segregation phenomena during the preparation, transport or storage of the sacks and in the course of mechanical distribution on the soil, and which contains no dust.

5 Yet another aim of the proposed method is to provide a water soluble complex NPK fertiliser in granules or prills which can be used in localised fertilisation-irrigation or in widespread fertilisation-irrigation, leaf fertilisation, hydroponic fertilisation, or usable also when the immediate availability of nutrients is required, but no specific application device is available and the product is distributed on the
10 soil, with subsequent irrigation by traditional methods.

A further aim of the method proposed by the present invention is to provide a water soluble complex NPK fertiliser in granules or prills, having such composition and homogeneity characteristics as to provide it with greater resistance against
15 compacting.

Description of the Illustrative Embodiment

These aims and others beside have been achieved by the Applicant which has found it useful to prepare a water soluble complex NPK fertiliser in the form of granules or prills by means of a method which comprises the following phases:

- 20 a) solubilisation in water of salts containing the fertilising elements of Nitrogen, Phosphor, and Potassium to form a solution, said solution comprising a fraction of non soluble solids in suspension;
- b) separation from the solution obtained during phase a) of the fraction of non soluble solids in suspension, thus obtaining a solution free of solids in suspension;
- 25 c) concentrating the solution free of solids in suspension obtained from phase b) until obtaining a solution; and
- d) cooling the solution obtained from phase c) until obtaining granules or prills.

The method consists of the solubilisation in water, during phase a), of salts containing the fertilising elements N, for instance in the form of ammonium nitrate

(NH_4NO_3), Phosphor. for instance in the form of mono-ammonium phosphate ($\text{NH}_4\text{H}_2\text{PO}_4$) and Potassium, for instance in the form of potassium nitrate KNO_3 .

From said solution is separated, during phase b), the fraction of the non soluble solids in suspension, thereby obtaining a solution without solids in suspension. Preferably said solution without solids in suspension contains no more than 80% of water weight. Possibly, to obtain the required composition, to the solution can be added other fertilising elements N, P, K and nutrients (meso and micro elements) such as S, Ca, Mg, Fe, Mn, Zn, Cu, B, Mo contained in water soluble salts.

The solution is concentrated by means of heating, during phase c), until obtaining a solution of molten salts. Preferably said solution of molten salts has a maximum water content of 5% by weight. The molten salt solution thereby obtained is then cooled, during phase d), in such a way as to obtain granules or prills having a size smaller than 7 mm; preferably smaller than 4 mm.

The method of the present invention allows to obtain a complex NPK fertiliser in the form of granules or prills having a solubility in water of at least 90% by weight; preferably at least 95% by weight; yet more preferably, at least 99% by weight.

The complex NPK fertilisers of the present invention present the advantage of having pronounced anti-compacting characteristics. Moreover, the complex NPK fertilisers of the present invention are free of dusts.

The complex NPK fertilisers of the present invention can be used in applications of localised fertilisation-irrigation or widespread fertilisation-irrigation, leaf fertilisation, hydroponic fertilisation, or can be used also when the immediate availability of nutrients is required but no specific application device is available and the product is distributed on the soil, with subsequent irrigation by traditional methods.

Some preferred embodiments of the method according to the present invention are described below with reference to the flow chart shown in Figure 1.

Said preferred embodiments are provided by way of non limiting examples and they are as follows:

A) the raw materials containing non water soluble solids 1 are dissolved in water with all raw materials which are perfectly soluble in water 7 until the required ratios are obtained. Subsequently, the resulting solution 2 is separated in two fractions, obtaining the resulting clear solution 3 and the insoluble body 10.

5 If integrations to the formulation are required, they are carried out when mixing between the flows 3 and 8; if no integration is required, the homogenisation (mixing) phase can be eliminated, directly obtaining flow 4 from flow 3.

10 B) The raw materials containing non water soluble solids 1 are dissolved in water separately from the perfectly water soluble raw materials 5. The resulting solution 2 is separated in two fractions, obtaining the resulting clear solution 3 and the insoluble body 10. The flows 3 and 6 are mixed. If necessary, during this phase the formulation is integrated by means of the flow 8. The current 4 is thereby obtained at the output.

15 C) The raw materials containing non water soluble solids 1 are dissolved in water together with some of the water soluble raw materials 7. Subsequently, the resulting solution is separated in two fractions, obtaining the clear solution 3 and the insoluble body 10. Some of the perfectly water soluble raw materials 5 are solubilised in water, obtaining the flow 6. The flows 3 and 6 are mixed together and the rest of the perfectly water soluble raw materials 8 are added thereto in order to integrate the solution with the required elements.

20 The addition of the integrating elements 8 can be carried out directly also in the flow 3 or in the flow 6 in a separate manner, before the total mixing of the various flows, guaranteeing in all cases the perfect solubilisation of said elements in the solution.

25 Alternatively one or more fully soluble salts containing nutrients (meso and/or micro elements) and/or one or more fully soluble salts containing the fertilising elements N, P, K, instead of being subjected to a prior solubilisation, are dissolved directly, partly during the solubilisation phase a) and partly solubilised in the solution obtained after the separation phase b).

Alternatively one or more fully soluble salts containing nutrients (meso and/or

micro elements) and/or one or more fully soluble salts containing the fertilising elements N, P, K, instead of being subjected to a previous solubilisation, are dissolved directly in the solution 3 obtained after separating the solids.

Alternatively one or more fully soluble salts containing nutrients (meso and/or
5 micro elements) and/or one or more fully soluble salts containing the fertilising elements N, P, K, are divided into three flows. a first flow is added to the solubilisation phase a), a second flow is added to the solubilisation phase a'), and a third flow is solubilised directly in the solution obtained from phase b).

Claims

1. A method for preparing water soluble fertilisers in the form of granules or prills comprising as fertilising elements Nitrogen, Phosphor and Potassium, characterised in that it comprises the following phases:

5 a. solubilisation in water of salts containing the fertilising elements of Nitrogen, Phosphor, and Potassium to form a solution, said solution comprising a fraction of non soluble solids in suspension;

b. separation from the solution obtained during the phase a) of the fraction of non soluble solids in suspension, thus obtaining a solution free of solids in suspension;

10 c. concentrating the solution free of solids in suspension obtained from the phase b) until obtaining a solution; and

d. cooling the solution obtained from the phase c) until obtaining granules or prills.

15 2. The method as claimed in claim 1, characterised in that the salt of the Nitrogen fertilising element solubilised during the phase a) is ammonium nitrate.

3. The method as claimed in claim 1, characterised in that the salt of the Phosphor fertilising element solubilised during the phase a) is mono-ammonium phosphate.

20 4. The method as claimed in claim 1, characterised in that the salt of the Potassium fertilising element solubilised during the phase a) is potassium nitrate.

25 5. The method as claimed in claim 1, characterised in that the solution free of salts in suspension obtained from the phase b) has a water content not exceeding 80% by weight.

6. The method as claimed in claim 1, characterised in that the solution in the

phase c) is concentrated until having a water content not exceeding 5% by weight.

7. The method as claimed in claim 1, characterised in that during the solubilisation phase a) also one or more soluble salts are dissolved, containing nutrients selected from the group consisting of S, Ca, Mg, Fe, Mn, Zn, Cu, B and Mo.

8. The method as claimed in claim 1, characterised in that during the solubilisation phase a) also one or more soluble salts containing fertilising elements selected from the group consisting of Nitrogen, Phosphor and Potassium are dissolved.

9. The method as claimed in claim 1, characterised in that it comprises a solubilisation phase a') separate from the phase a) during which one or more soluble salts containing nutrients selected from the group consisting of S, Ca, Mg, Fe, Mn, Zn, Cu, B and Mo are dissolved and a mixing phase during which, before the concentration phase c), the solutions obtained respectively from the phase b) and from the phase a') are mixed together.

10. The method as claimed in claim 1, characterised in that it comprises a solubilisation phase a') separate from the phase a) during which one or more soluble salts containing fertilising elements selected from the group consisting of Nitrogen, Phosphorus and Potassium are dissolved and a mixing phase during which, before the concentration phase c), the solutions obtained respectively from the phase b) and from the phase a') are mixed together.

11. The method as claimed in claim 1, characterised in that the during the solubilisation phase a) a first portion of one or more soluble salts containing nutrients selected from the group consisting of S, Ca, Mg, Fe, Mn, Zn, Cu, B and Mo is dissolved, while a second portion of said soluble salts is dissolved during the

solubilisation phase a') separate from the phase a), said solutions obtained respectively from the phases b) and a') being mixed together, before the concentration phase c).

12. The method as claimed in claim 1, characterised in that during the solubilisation phase a) a first portion of one or more soluble salts containing fertilising elements selected from the group consisting of Nitrogen, Phosphor and Potassium is dissolved, while a second portion of said soluble salts is dissolved during the solubilisation phase a') separate from the phase a), said solutions obtained respectively from the phases b) and a') being mixed together, before the concentration phase c).

13. The method as claimed in claim 1, characterised in that after the phase b), one or more soluble salts containing the nutrients selected in the group consisting of S, Ca, Mg, Fe, Mn, Zn, Cu, B and Mo are dissolved directly in the solution.

14. The method as claimed in claim 1, characterised in that after the phase b), one or more soluble salts containing the fertilising elements selected in the group consisting of Nitrogen, Phosphorus and Potassium are dissolved directly in the solution.

15. The method as claimed in claim 1, characterised in that one or more soluble salts containing the nutrients selected from the group consisting of S, Ca, Mg, Fe, Mn, Zn, Cu, B and Mo, are in part dissolved during the solubilisation phase and in part solubilised during the phase obtained after the separation phase b).

16. The method as claimed in claim 1, characterised in that one or more soluble salts containing the fertilising elements selected from the group consisting of NPK, are in part dissolved during the solubilisation phase and in part solubilised during the

phase obtained after the separation phase b).

17. The method as claimed in claim 1, characterised in that one or more soluble salts containing nutrients selected from the group consisting of S, Ca, Mg, Fe, Mn, Zn, Cu, B and Mo are divided into three flows whereof respectively the first one is added to the solubilisation phase a), the second one is added to the solubilisation phase a') and the third one is solubilised directly to the solution obtained from phase b).

18. A method as claimed in claim 1, characterised in that one or more soluble salts containing fertilising elements selected from the group consisting of NPK are divided into three flows whereof respectively the first one is added to the solubilisation phase a), the second one is added to the solubilisation phase a') and the third one is solubilised directly to the solution obtained from phase b).

19. A water soluble fertiliser in the form of granules or prills comprising as fertilising elements Nitrogen, Phosphorus and Potassium obtained according to a method comprising the following phases:

- a. solubilisation in water of salts containing the fertilising elements of Nitrogen, Phosphor, and Potassium to form a solution, said solution comprising a fraction of non soluble solids in suspension;
- b. separation from the solution obtained during the phase a) of the fraction of non soluble solids in suspension, thus obtaining a solution free of solids in suspension;
- c. concentrating the solution free of solids in suspension obtained from the phase b) until obtaining a solution; and
- d. cooling the solution obtained from the phase c) until obtaining granules or prills.

20. The fertiliser as claimed in claim 19, characterised in that it has a solubility in water of at least 90% by weight.

21. The fertiliser as claimed in claim 19, characterised in that it has a solubility in water of at least 95% by weight.

22. The fertiliser as claimed in claim 19, characterised in that it has a solubility in water of at least 99% by weight.

23. The fertiliser as claimed in claim 19, characterised in that the granules or prills have a dimension lower than 7 mm.

24. The fertiliser as claimed in claim 19, characterised in that the granules or prills have a dimension lower than 4 mm.

25. The fertiliser as claimed in claim 19, characterised in that it is obtained by a method in which, during the solubilisation phase a), also one or more soluble salts containing nutrients selected from the group consisting of S, Ca, Mg, Fe, Mn, Zn, Cu, B and Mo are dissolved.

26. The fertiliser as claimed in claim 19, characterised in that it is obtained by a method in which, during the solubilisation phase a), also one or more soluble salts containing fertilising elements selected from the group consisting of Nitrogen, Phosphorus and Potassium are dissolved.

27. The fertiliser as claimed in claim 19, characterised in that it is obtained by a method which comprises a solubilisation phase a') separate from the phase a) during which one or more soluble salts containing nutrients selected from the group consisting of S, Ca, Mg, Fe, Mn, Zn, Cu, B and Mo are dissolved and a mixing phase during which, before the concentration phase c), the solutions obtained respectively from the phase b) and from the phase a') are mixed together.

28. The fertiliser as claimed in claim 19, characterised in that it is obtained by a method which comprises a phase a') separate from the phase a) during which one or more soluble salts containing fertilising elements selected from the group consisting of Nitrogen, Phosphorus and Potassium are dissolved and a mixing phase during which, before the concentration phase c), the solutions obtained respectively from the phase b) and from the phase a') are mixed together.

29. The fertiliser as claimed in claim 19, characterised in that it is obtained by a method in which, during the solubilisation phase a) a first portion of one or more soluble salts containing nutrients selected from the group consisting of S, Ca, Mg, Fe, Mn, Zn, Cu, B and Mo is dissolved, while a second portion of said soluble salts is dissolved during the solubilisation phase a') separate from the phase a), said solutions obtained respectively from the phases b) and a') being mixed together, before the concentration phase c).

30. The fertiliser as claimed in claim 19, characterised in that it is obtained by a method in which, during the solubilisation phase a) a first portion of one or more soluble salts containing fertilising elements selected from the group consisting of Nitrogen, Phosphor and Potassium is dissolved, while a second portion of said soluble salts is dissolved during the solubilisation phase a') separate from the phase a), said solutions obtained respectively from the phases b) and a') being mixed together, before the concentration phase c).

31. Use of the fertiliser as claimed in claim 19 in the localised fertilisation-irrigation, in widespread fertilisation-irrigation, in leaf fertilisation-irrigation, in hydroponic fertilisation-irrigation or by means of a distribution on the soil followed by irrigation.

ABSTRACT

The present invention relates to a method for the preparation of a complex NPK fertilizer in the form of granules or prills, and to a method for its preparation and to the related use of the fertilizer thereby obtained. In particular the present invention relates to a fertilizer containing as fertilizing elements Nitrogen N, Phosphor P, Potassium K, meso elements like Calcium Ca, Magnesium Mg, Sulphur S, and micro elements like Iron Fe, Manganese Mn, Zinc Zn, Copper Cu, Boron B and Molybdenum Mo.

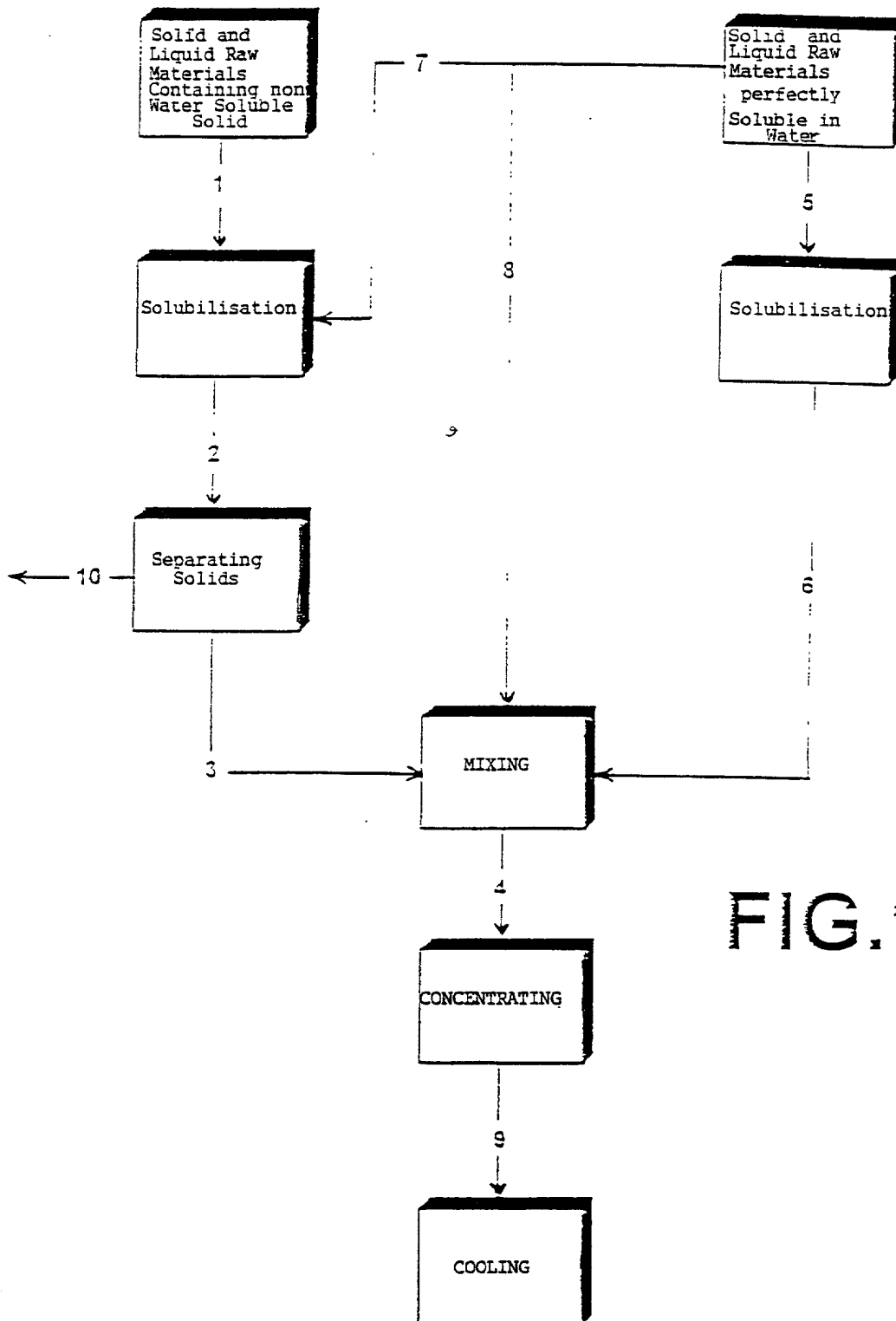


FIG.1

Combined Declaration for Patent Application and Power of Attorney

As a below-named inventor, I hereby declare that:

My residence, post office address and citizenship are as stated below next to my name; and that I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled

WATER SOLUBLE COMPLEX FERTILIZERS, METHOD FOR THEIR PREPARATION AND RELATED USE.

the specification of which (check one)

- [X] is attached hereto;
 [] was filed in the United States under 35 U.S.C. §111 on _____, as
 U.S. Appln. No. _____*; or
 [] was/will be filed in the U.S. under 35 U.S.C. §371 by entry into the U.S. national stage of an international (PCT) application, PCT/_____: filed _____, entry requested on _____*;
 national stage application received U.S. Appln. No. _____*; §371/§102(e) date _____*
 (* if known)

and was amended on _____ (if applicable).
(include dates of amendments under PCT Art. 19 and 34 if PCT)

I have reviewed and understand the contents of the above-identified specification, including the claims, as amended by any amendment referred to above; and I acknowledge the duty to disclose to the Patent and Trademark Office (PTO) all information known by me to be material to patentability as defined in 37 C.F.R. §1.56.

I hereby claim foreign priority benefits under 35 U.S.C. §§ 119 and 365 of any prior foreign application(s) for patent or inventor's certificate, or prior PCT application(s) designating a country other than the U.S., listed below with the "Yes" box checked and have also identified below any such application having a filing date before that of the application on which priority is claimed:

<u>IT-RM99A000671</u>	<u>ITALY</u>	<u>29 October 1999</u>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
(Number)	(Country)	(Day Month Year Filed)	YES	NO
_____	_____	_____	<input type="checkbox"/>	<input type="checkbox"/>
(Number)	(Country)	(Day Month Year Filed)	YES	NO

I hereby claim the benefit under 35 U.S.C. §120 of any prior U.S. non-provisional application(s) or prior PCT application(s) designating the U.S. listed below, or under §119(e) of any prior U.S. provisional applications listed below, and, insofar as the subject matter of each of the claims of this application is not disclosed in such U.S. or PCT application in the manner provided by the first paragraph of 35 U.S.C. §112. I acknowledge the duty to disclose to the PTO all information as defined in 37 C.F.R. §1.56(a) which occurred between the filing date of the prior application and the national filing date of this application:

_____ (Application No.)	_____ (Day Month Year Filed)	_____ (Status: patented, pending, abandoned)
_____ (Application No.)	_____ (Day Month Year Filed)	_____ (Status: patented, pending, abandoned)
_____ (Application No.)	_____ (Day Month Year Filed)	_____ (Status: patented, pending, abandoned)

As a named inventor, I hereby appoint the following registered practioners to prosecute this application and to transact all business in the Patent and Trademark Office connected therewith:

All of the practioners associated with Customer Number 001444

Direct all correspondence to the address associated with Customer Number 001444: i.e.,

BROWDY AND NEIMARK, P.L.L.C.
624 Ninth Street, N.W.
Washington, D.C. 20001-5303
(202) 628-5197

The undersigned hereby authorizes the U.S. Attorneys or Agents appointed herein to accept and follow instructions from _____ as to any action to be taken in the U.S. Patent and Trademark Office regarding this application without direct communication between the U.S. Attorneys or Agents and the undersigned. In the event of a change of the persons from whom instructions may be taken, the U.S. Attorneys or Agents appointed herein will be so notified by the undersigned.

Title: Water Soluble Complex Fertilisers, Method for their preparation and related Use.

U.S. Application filed _____, Serial No. _____

PCT Application filed 24.10.2000 ✓, Serial No. PCT/IT00/00428 ✓

I hereby further declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under 18 U.S.C. §1001 and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

FULL NAME OF FIRST INVENTOR SABATINI Nicola		INVENTOR'S SIGNATURE <i>Nicola Sabatini</i>	DATE 2001
RESIDENT 66100 CHIETI - ITALIA ITX		CITIZENSHIP Italian ✓	
POST OFFICE ADDRESS Via F. Viaggi, 3			
FULL NAME OF SECOND JOINT INVENTOR		INVENTOR'S SIGNATURE	DATE
RESIDENT		CITIZENSHIP	
POST OFFICE ADDRESS			
FULL NAME OF THIRD JOINT INVENTOR		INVENTOR'S SIGNATURE	DATE
RESIDENT		CITIZENSHIP	
POST OFFICE ADDRESS			
FULL NAME OF FOURTH JOINT INVENTOR		INVENTOR'S SIGNATURE	DATE
RESIDENT		CITIZENSHIP	
POST OFFICE ADDRESS			
FULL NAME OF FIFTH JOINT INVENTOR		INVENTOR'S SIGNATURE	DATE
RESIDENT		CITIZENSHIP	
POST OFFICE ADDRESS			
FULL NAME OF SIXTH JOINT INVENTOR		INVENTOR'S SIGNATURE	DATE
RESIDENT		CITIZENSHIP	
POST OFFICE ADDRESS			
FULL NAME OF SEVENTH JOINT INVENTOR		INVENTOR'S SIGNATURE	DATE
RESIDENT		CITIZENSHIP	
POST OFFICE ADDRESS			

ALL INVENTORS MUST REVIEW APPLICATION AND DECLARATION BEFORE SIGNING. ALL ALTERATIONS MUST BE INITIALED AND DATED BY ALL INVENTORS PRIOR TO EXECUTION. NO ALTERATIONS CAN BE MADE AFTER THE DECLARATION IS SIGNED. ALL PAGES OF DECLARATION MUST BE SEEN BY ALL INVENTORS.